DITCHBURN VENDING MACHINES

Minicold 670 Service Manual

DITCHBURN VENDING MACHINES LIMITED
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I N D E X

INDEX (Continued)

Carbon Dioxide

GENERAL DESCRIPTION

The Minicold "670" is designed to give long periods of trouble-free operation but in the event of service being required, the layout assembly is such as to allow preventive maintenance or major repair on site without the use of special equipment.

MC1. CABINET

The cabinet is manufactured from zintec (a zinc-coated steel), and is of welded and reinforced construction.

The finish comprises an etch primer, a stoved colour primer, and two coats of wet on wet synthetic stoving enamel.

This gives a high-quality, durable, medium gloss finish. Scratches or damage to the finish in service can be rectified by using a matching air drying synthetic enamel which is available from our Service Department and which can be applied either by spray or brush.

MC2. COMPONENTS

All the components concerned with the storage and dispensing of water and ingredients are of stainless steel, plastic or other non-toxic material, thus conforming to the Water Board and Ministry of Health requirements.

CUP DISPENSER

MC3. CUP MECHANISM

"Dixie Merkle" specially produced for "Minicold" and designed for use with tall 7 oz. cups (Lily 785 or equivalent). The unit is not adjustable for cup size, but can be supplied for use with 7 oz. squat cups against special order.

NOTE - At approximately 4 to 6-weekly intervals the oil level in the cup dispenser gear box should be checked. When viewing the cup dispenser unit from the front with the door of the machine open, a round-head screw will be observed on the gear box of the unit (which is the circular die cast box). The screw should be removed and a light grade oil added until the level indicated on the gear box is reached.

Similarly all moving parts, i.e. gears, bearing, dropping worms, etc., should be examined for cleanliness and thin oil applied sparingly. Excessive oiling will lead to a soiled cup or contaminated drink.

MC4. ADJUSTMENT (TIMING)

For timing adjustment refer to the installation and set-up instructions supplied with every dispenser. These instructions detail the process of adjustment.

MC5. CUP STATION ADJUSTMENT

The cup, when dispensed, passes down the cup chute and comes to rest on the cup station grid. In order that the drink will flow cleanly into the cup it is necessary that this be accurately positioned at each serving. This is achieved by the use of a cup stop which is attached to the cup station grid and is adjustable to allow for slight variation in the types of cups used. When properly adjusted the cup should sit snugly against it. The correct action of the cup chute and station should be checked by dropping cups down the cup chute and noting the delivery action on contacting the stop. Securely tighten when properly located.

OPERATION

MC6. DISPENSER

Dispensing the cup at the appropriate moment is only one of the duties performed by the cup dispensing unit.

The cup must now be filled with the appropriate quantity of water and ingredients. To do this it is necessary to "meter" both the water and the syrups.

Water is metered by accurate control of time, pressure and valve orifice. Syrup is metered by accurate control of time only since the syrup is dropped by gravity through a pre-determined valve orifice directly into the cup. Since the cup dispenser always takes exactly the same time to complete one vend cycle, it can also be used to provide the necessary time control for drink dispensing.

MC7. DISPENSER CAMS

Examination of the unit will reveal that situated beneath its base is a shaft driven by a geared motor unit on which are mounted six cams, each operating a micro-switch. These cams are themselves adjustable since they are formed from two halves, each half having 50 per cent of its circumference approximately 3/16ths in. higher than the remaining 50 per cent. Positioning of the one half against the other will, therefore, determine the amount of "high side" of the cam to the "low side" presented to the micro-switch during its complete cycle, thus rendering it possible to adjust the length of time for which the switch is held open on each vend cycle. All cams can be individually adjusted for their particular duty.

On no account must the cams be rotated in a backwards direction (clockwise when viewed from the underneath of the dispensing unit) or the micro-switch operating levers will be damaged.

MC8. WATER CAM OPERATION

Two cams are used to control the delivery of water in Minicold model 670C machines. That cam nearest to the dispenser motor is used to control the delivery of carbonated water to the cup and that cam most remote from the motor (i.e. cam No. 6) is used to control the delivery of non-carbonated water, and in conjunction with the level control system (see Section No. MC41) the water pump when serving a non-carbonated drink.

These cams are normally connected to operate on the low side only and control the duration of water flow to the cup.

MC9. VEND CAM OPERATION

The second cam, or "vend cam", performs a "two-fold" duty:-

1) When the low side of the cam is opposite the switch operating lever (dispenser at standstill), it supplies electricity to one end of the vend relay energising coil.

2) When the high side of the cam is opposite the switch operating lever (dispenser in motion), it supplies power to the vend motor, thus maintaining the vend cycle for one complete revolution and at the same time removing the electricity supply from the vend relay coil, permitting this relay to return to its static position in readiness to initiate the next vend cycle.

MC10. SYRUP CAMS

The remaining cams each operate an individual syrup. The Syrup cams are positioned in the following order.

3rd cam from motor ... ... Syrup Tank No. 3
4th cam from motor ... ... Syrup Tank No. 2
5th cam from motor ... ... Syrup Tank No. 1

MC11. CAM ADJUSTMENT

All cams which are normally wired to operate at the 'low side' are adjusted at the factory to deliver the quantity of ingredients recommended by the ingredient manufacturer when serving a 6 oz drink.

MC12. "SOLD OUT" FEATURE

The final function of the cup dispenser is to prevent the customer from losing his money if the machine has sold out. This is achieved by the use of a coin "block out" solenoid situated in the coin actuator channel, which, when it is de-energised, places an obstruction in the coin passage of the mechanism, deflecting coins to the reject path and returning them to the customer via the rejected coin cup. The block-out solenoid receives its electricity supply via the "cup empty" or "sold out" switch situated in the cup dropping portion of the dispenser, the switch being held "closed" when cups are present, but falling to the "open" position when all cups have been used. (See also Section MC30 "Pressure Switch").

MC13. CUP TURRET OPERATION

The turret of the cup dispensing unit consists of 3 columns, one, the serving column, the others, the reserve columns, one of which is positioned behind the serving column and the other to the left hand of the serving column. These reserve columns are supported on collapsible platforms which guide the reserve cups into the throat of the dispenser when the appropriate signal is provided to the respective cup release solenoid by the cup empty switch which is situated within the throat of the cup dispensing unit. For adjustment and detailed operation of this system see Fig. 8 at the end of this Manual.

COIN MECHANISM

MC14. GENERAL DESCRIPTION

The coin mechanism normally supplied with the machine is of the National Rejector Series "6000" operating with a single coin, although it is possible to equip the machine with mechanisms which will operate on combinations of similar or dissimilar coins to meet most requirements. Such mechanisms normally give long service and need little attention, but on some locations it may be found that greasy or dirty coins are used and this can give rise to the need for regular cleaning of the mechanism.

2. Actuating Channel

To remove, this unit should be grasped firmly, lifted upwards and towards you, when it will be freed from the machine

MC16. CLEANING AND ADJUSTMENT

1. Cleaning

The following simple procedure should be adopted to clean the rejector.

a) SOAK Place rejector in boiling water and allow to soak for about ten minutes.

b) SCRUB Use a stiffish paint brush with a detergent to clean foreign matter off the rejector. Take care not to damage delicate parts such as the spring on the 6d. rejector scavenger plate.

c) RINSE Rinse in clean boiling water.

d) DRY Dry thoroughly by shaking or by applying filtered compressed air.

e) LUBRICATION Remove any cradles, clean cradle bushing and pins with a piece of pegwood, a matchstick or similar non-metallic tool, and apply silicone solution sparingly. Apply a touch only of white grease to the coils of the wiper blade spring and the scavenger spring of the 6d rejector. Otherwise do NOT lubricate.

f) PRECAUTIONS Care should be taken not to lose delicate pins, clips, etc., and as all components removed for cleaning are easily replaced, force must not be applied during re-assembly.

2. Adjustment

a) Rejectors are carefully adjusted at the Works to accept as wide a range of coins as possible, consistent with maximum slug rejection, but it may be found desirable after a considerable period of service, to check and re-adjust the unit. To do this it is recommended that a simple bench fixture be produced to hold the mechanism in a level and vertical position and allow access from either side. The mechanism must be held accurately but firmly so as not to subject it to strain or force which can detract from its efficiency or even render it inoperative. The magnets and coin path should be visually inspected to ensure that the unit is free from foreign matter prior to carrying out any adjustment: if dirty, the standard cleaning procedure should be adopted and the mechanism re-checked to ensure that adjustment is really necessary.

All screws should be tight and a little white grease should be present on the coils of the wiper blade, springs, etc.

Before making any adjustment, be certain that the reason for such action is understood and the adjustment intended will remedy the error. Guesswork is seldom successful and usually increases the difficulties and degree of error. If good coins are hanging up or not being accepted, or certain types of slugs or foreign coins are being passed, carefully consider their size, weight, metal composition and magnetic properties, etc. before making any adjustment. Visualise the path of the coin or slug through the rejector and determine at what point in its travel deviation from the normal path occurs, and what adjustment is necessary at what point to remedy the error.

Remember, OVER ADJUSTMENT may remedy the acceptance of one undesirable coin or slug, but may cause others to be accepted or good coins to be rejected. After stand adjustments are made, finally test in machine and correct if necessary - be sure to test as many types of coins and slugs as possible to make certain that the intricate balancing of the rejection and acceptance mechanism has not been disturbed for the coin concerned.

b) 3d. REJECTOR AND OTHERS having a "deflector" and "separator". The deflector is so set that good coins just miss striking it; they then drop on to the separator where good coins fall with their centres of gravity on the "string catcher" side; slugs and bad coins fall on to the separator with their centres of gravity on the other side and so are diverted to the reject outlet. To widen the adjustment, loosen its locking screw and move separator slightly towards the reject outlet side and then tighten up locking screw (warning - do not overtighten). Move the separator in the opposite direction to increase selectivity. If other adjustments are found necessary, return rejector to the service division

c) 6d REJECTORS If coins hang up at the "washer retainer" pin - it may be necessary to give the pin a slight inclination towards the magnet. To do this, a slight set should be given to the flat spring by twisting it with the fingers. WARNING Do not bring spring away from bracket and do not overtwist, as this will interfere with the function of the spring in holding up washers and pushing undersize slugs and coins through the gap in the main plate. Normally, the runway should NOT be altered - it is set to deal with undersize diameter slugs and coins. If necessary, adjust the separator as for 3d. rejectors. If other adjustments are found necessary, return rejector to the service division.

MC17. CHANGING PRICE AT WHICH MACHINE VENDS

When it is felt desirable to change the price at which drinks are vended, it must be remembered that it is not only necessary to change the mechanism and channel, but also the other price indications on the face of the machine. When replacing the mechanism, care must be taken to ensure that the entire unit is again sitting correctly in position on the three mounting spigots and that the hinged flat of the coin guide funnel at the top of the mechanism is sitting correctly behind the rejector plate of the mechanism itself. Mis-positioning of this flap will lead to coins being thrown back into the body of the machine and consequent loss to the customer of both money and drink.

MC18. WATER SYSTEM

Water, normally obtained from the supply authorities mains is directed via a filter and inlet solenoid to a stainless steel storage tank. The water level is controlled by a ball valve assembly manufactured to the appropriate British Standard Specification. The tank is situated at the rear of the cabinet and immediately above the refrigeration compartment in the base of the machine which also houses the carbonator pump to which the tank is connected.

MC19. CARBONATOR PUMP

The Carbonator pump is of the centrifugal type. It is gravity fed from the Water Tank above and its output is directed to the water cooling unit from whence water is served either directly to the cup as still water or under pressure to the carbonating chamber. (See figure 2)

REFRIGERATION SYSTEM

MC20. COMPRESSOR UNIT

Refrigeration is provided by $\frac{1}{8}$ H.P. Hermetically-sealed compressor unit which is coupled to the evaporating coil of the carbonator cooler unit by heat exchanger tubing. (See figure 3).

MC21. FILTER/DRYER

A filter dryer unit is embodied in the system. This unit is sometimes external to the static type condenser situated in the cooling duct at the rear of the machine but on some occasions it is an integral part of the static condenser and is, therefore, not visible.

MC22. REFRIGERANT

The Refrigerant is "freon 12" and the charge is 7 ozs.

The Refrigeration system is hermetically sealed and the charging tube is "crimped off" in manufacture. No attempt should be made by the field engineer (who is not a qualified refrigeration engineer) to break open this system since special equipment is required to deal with it.

MC23. REFRIGERATION CONTROLS

No adjustment whatever is available to the engineer since the system is "capillary controlled" in association with an Ice Bank Controller.

MC24. ICE BANK CONTROLLER

An Ice Bank Controller unit is similar in operation to a refrigeration type thermostat. The unit consists of a magnetically assisted pressure type switch which is capillary coupled to a sensing head situated near to the evaporating coil for the system which it is to control.

The sensing head contains water and by nature of the change in pressure which occurs between the "frozen" and the "liquid" state, the control unit "switches on" when the water is "liquid" and "switches off" when the water is "frozen". From this it follows that there is no temperature adjustment within the controller unit, neither is there an adjustment for "differential".

MC25. CARBONATOR COOLER UNIT

The Minicold carbonator cooler unit is of the "Ice Bank" thermal storage design and as such is a "sealed unit" which should not be "serviced in the field". The following description is included simply to provide the service engineer with an understanding of the operation of the equipment as a whole.

Enclosed in a stainless steel box filled with pure clean water are the following components, connections from which are brought through the top surface of the box. Towards the rear of the box is situated a refrigeration evaporator coil. To the right hand and in front of this coil is situated a stainless steel carbonating chamber which is equipped with water and CO_2 non-return valves, a safety valve and an electric level control system. In front of the evaporator coil and to its left hand is situated a still water cooling coil, the inlet of which is directly coupled to the carbonator pump and the outlet to the still water serve solenoid and the inlet port to the carbonating chamber.

Syrup Cooling Coils (normally three) also pass through the chilled water bath and a rotary agitator unit is embodied.

MC26. OPERATION

When the machine is connected to the electricity mains for the first time the refrigeration unit will commence to run and will in turn commence to cool the evaporating coil. The temperature of this coil will rapidly fall below the freezing point of water and this in turn will give rise to the formation of ice around the exterior of the evaporator coil. This process is allowed to continue until an adequate quantity of ice has been formed. The growth of the Ice Bank is controlled by the operation of the Ice Bank Controller previously referred to and only when the entire bulb or sensing head of this controller unit has been completely engulfed in ice will the compressor be switched off. The initial "cool down period" is normally of 4 or 5 hours duration.

Due to convection currents, the remaining water in the cooler unit will attain the temperature of melting ice. Since the carbonating chamber and the still water coil are immersed in this water they too will have achieved a temperature in the order of 32° Fahrenheit as will the water stored in these two units.

Very cold water can now be drawn either as still water through the still water serve solenoid or sparkling water via the carbonated water serve solenoid and directed to the cup together with syrup which will also be chilled since this has been stored in the syrup cooling coil which passes through the chilled water unit.

The serving of water and syrup from the unit will, of course, introduce comparatively warm water from the break tank and comparatively warm syrup from the syrup storage canisters.

If no further drinks are sold, then the warmer liquid introduced to the cooler unit will in turn achieve a temperature near to 32° Fahrenheit (i.e. the temperature of the surrounding water). If, however, further drinks are served in rapid succession then some means of transferring the extreme cold from the Ice Bank to the warmer coils carrying water and syrup must be provided. For this purpose a mechanical agitating blade is embodied in the unit and this is driven for the duration of each vend cycle by a small shaded pole motor situated at the top of the cooler unit. This ensures a very rapid heat exchange and a very large quantity of very cold drinks can be served from this unit.

CARBON DIOXIDE

MC27. CYLINDER

The carbon dioxide gas system together with its cylinder is also closely associated with the carbonator cooler system. The supply of gas is normally obtained from a 7 "lb" size cylinder. (See figure 2).

MC28. GAS REGULATOR UNIT

Directly connected to the gas cylinder is the gas pressure unit regulator which is equipped with a scintered bronze inlet filter at its connection point to the gas cylinder and a low pressure cut out switch (See Section 2).

This regulator controls the pressure at which gas is supplied to the carbonating chamber to produce the sparkling water. This is normally set to 75 lbs per square inch. The regulator units are extremely reliable and on no account should the adjustment screw at the top of the metal cone be interfered with, unless a suitable pressure gauge is available to accurately measure the gas pressure within the carbonating system. Gauges should be fitted (with the aid of an adaptor plug) to the non-return valve Body at the lip of the carbonating chamber.

MC29. CYLINDER CAPACITY

The capacity of the 7 lb. gas cylinder is such (when the machine is adjusted to serve approximately $3\frac{1}{2}$ volume carbonation and allowing for the diversity of still and carbonated drinks) as to provide approximately 2,000 drinks before the cylinder needs replacing.

MC30. PRESSURE SWITCH

The low pressure cut out switch attached to the high pressure regulator is so connected as to operate the block-out relay within the coin mechanism when the gas pressure within the carbon dioxide cylinder has fallen below that pressure required to produce a high quality carbonated drink. The unit is normally set to "cut out" at approximately 100 lb. per square inch, and to "cut in" at approximately 125 lbs. per square inch.

MC31. CYLINDER COUPLING WASHER

To ensure the maximum life from the gas cylinder, it is necessary to ensure that a gas tight joint has been obtained between the coupling union of the machine and the gas bottle. For this purpose a white fibre washer is used. This washer should be replaced without fail at every occasion when the cylinder is changed. When "turning on the gas" after replacing the cylinder, care should be taken to ensure that the valve is fully open and "back-seated". Failure to carry out either of these instructions can lead to a severe gas leak and complete loss of carbon dioxide gas.

MC32. CONTENTS OF CYLINDER

The contents of a cylinder can only be determined by weight. The tare weight of each cylinder is stamped on the neck of the cylinder. The difference between the total weight and the tare weight is the amount of gas contained.

MC33. SUPPLY REQUIREMENTS

The MINICOLD 670 is designed to operate on 50 cycle A.C. current only and as it leaves the factory will operate satisfactorily on supplies of from 220/250 volts.

MC34. BOOSTER UNIT

Installations with alternating current outside these voltages can normally be dealt with by the installation of an additional unit which can be connected into the main electrical panel beneath the cup dispensing shelf. (Installation instructions are issued with each unit).

MC35. VEND RELAY

MINICOLD operates on one relay only, this is situated in the electrical box on the door of the machine (Figs. 1).

MC36. CONNECTION TO MAIN

Standard British colour coding is observed, i.e. Black - Neutral, Red - Live, Green - Earth, and it is absolutely essential that this sequence be observed when connection to the mains is made.

MINICOLD does not contain fuses and should, therefore, be connected to the mains by means of a 13-amp fused plug or via a "switch fuse unit" if a permanent connection is required.

MC37. EARTHING

It is essential that the machine is efficiently earthed.

MC38. OVERFLOW DRIP CONTROL

A drip-tank is provided within the machine to collect any liquid which may be spilled when the customer takes his drink or to accept water if, through any failure, this should continue to flow. When the drip-tank is approximately three-quarters full, a ball float operates the drip can micro-switch, turning off all electricity and water supplies to the machine.

MC39. OPERATING CYCLE

The coin on insertion, passes through the rejector mechanism, and is accepted, is then directed into the cash box. As it passes to the cash box, it strikes the operating lever of the coin-actuated switch situated in the coin-actuator channel. This provides a momentary pulse to the vend relay which immediately closes. This provides power to the cup dispenser motor which then completes one cycle. (Figs. 1).

MC40. ANTI-JACKPOT FEATURE

The electricity supply to one side of the vend motor is made via the normally closed contacts of the coin-operated switch. This ensures that the motor does not run if the switch is held open and that the coin must pass into the cash box before the vend can commence. Only one drink per coin can be served.

MC41. ELECTRICALLY OPERATED LEVEL CONTROLS

Electrically operated level controls or probe controls as they are sometimes called, whilst fulfilling the same function as the ball float type of control, have one fundamental difference in their operation.

The electrical system operates at two pre-determined levels. These are the top level, when the tank is full, and the bottom level, when the tank requires refilling. The difference between these two levels is referred to as the system "differential". A ball float system clearly has no differential since wate. is permitted to enter the tank the moment the ball moves at all in the downwards direction.

An electrically operated probe control level system consists of a three element probe unit, a sensitive relay and an isolating transformer. The system draws its electrical supply from the secondary side of the transformer and is not, therefore, in direct connection with the alternating current electricity supply from the mains (See Fig. 1).

OPERATION

The Probe consists of an outer frame which connects the metal body of the water tank (P1) and is at earth potential (Green wire). A low conductivity carbon probe (P2) which is the "low level" control (Black wire). The third element takes the form of a stainless steel tube (P3). This forms the outer sheath of the low level probe and is the "high level" control (Red wire).

The controlled component, in this case, the carbonator pump, draws its operating electricity supply directly from the AC mains. This supply is switched on and off at the appropriate moment by the normally closed contacts (Figure 9 - C1) of relay R, i.e. the pump is operating when the relay is de-energised. This condition exists when the carbonator is empty. Water will then enter the carbonator and the level will rise until water reaches the high level probe, (Figure 7 - P3) at which instant sufficient current passes through the water from P1 to P3 to energise Relay R, which then closes and in so doing "Open circuits" contacts C1 and thus switches off the pump and prevents further water entering the carbonator. A second pair of contacts is operated by relay R and these are "normally open" (Figure 7 - C2). The purpose of this pair of contacts is to bring into operation the low level probe P2 which has been inoperative whilst the carbonator has been filling. *Fig.7

Sparkling water is now drawn from the carbonator by normal operation of the machine, but relay R cannot "fall open"since sufficient current is passing from P1 to P2 to retain this relay in an energised condition. When the quantity of water drawn from the tank exposes the low level probe P2 Relay R "falls open", thus switching out the low level probe and at the same instant switching on the pump, refilling the carbonator to its normal level.

Further use of the machine will draw water from the carbonator and lead to repetition of the cycle described above. The carbonator is replenished by similar quantities at each filling.

The potential difference between P1 and P3 is very small and the current passed through the water is very minute. No electrolic action takes place.

When serving a still drink because water as stored in the break tank and in the water cooling coil of the carbonator cooling unit is at atmospheric pressure, it is necessary to raise the pressure in order to deliver the cold water to the cup. This is achieved by operating the carbonator pump at the same time as the still water valve is serving.

From the description of the Level Control operation above, it will be seen that the carbonator pump operates only when the level control relay is de-energised.

When serving a "still" drink the level control relay is de-energised by removing the supply of electricity from the primary and level control transformer. (See Diagram 1). This is achieved by making the "live" feed to the level control transformer via the normally closed contacts of the still water switch on the cup dispensing unit (See Section MC10).

Flooding of the carbonator would take place if this condition were allowed to exist when serving "sparkling" drinks. To eliminate this possibility the rear wafer of the drink-selector switch on the door of the machine is connected across the normally closed contacts of the still water switch of the cup dispensing unit so as to short circuit these contacts whenever a "sparkling" drink is selected.

MC42 SOLENOID VALVES

A solenoid valve is, in effect, an electrically operated, remotely controlled tap, and as such, will require periodic cleaning and replacement of washers, etc. The construction of the valve will readily be understood from the section of diagram at the end of this manual (Fig. 4).

When it becomes necessary to service the valve, all that is required, after turning off the electricity and water supply to the machine is:-

1. Remove the nut and identification plate at the top of the coil cover.
2. Lift coil and cover clear of bonnet stem.
3. Remove bonnet by turning in an anti-clockwise direction by the use of either a special key which will locate in the hole which exists in the bonnet face, or by very carefully gripping the bonnet stem a near as possible to the top, without damaging the thread. It will be obvious from the diagram that to grip the bonnet low down will cause the tube to collapse and render the valve inoperative. Examination of the valve seating plug will determine whether it is fit for further service, or whether it needs replacing. The face of the seating should be flush with the surrounding metal of the plunger stem.

If the plug is distorted or damaged, it can be removed by prising it out of the plunger with a small screwdriver. A replacement plug can most easily be pressed into position by first wetting it. It must finally sit in position with its face level with the face of the valve plunger. The rubber sealing washer for the bonnet should also be examined whilst the valve is open and replaced if this shows the slightest sign of deterioration. Re-assembly of the valve is achieved by reversing the above procedure (See Fig. 4).

W.H. valves embody a flow control which screws in and out of the valve body. Leakage of water at this point is prevented by the presence of a rubber "O" ring which sits in a recess on the control screw. Should it prove necessary to replace this seal, the procedure is to remove the stop screw (the head of which prevents the body of the control screw being withdrawn too far), the control screw is then turned in an anti-clockwise direction until it can be completely withdrawn. The damaged "O" ring should then be removed and a new one "rolled" into position. Again, this should be fitted WET and extreme care should be exercised when refitting the control screw to the body of the valve. Careless fitting will result in a sliver of rubber being removed from the "O" ring which will then leak.

Bone fibre washers are used at each pipe junction to valve body, and these should be replaced every time a joint is broken. Failure to do so may lead to a small fragment of the washer being carried into the valve body which may either block the passage through the valve or hold the plunger open.

In the unlikely event of a solenoid valve coil failure, it must be remembered when replacing this unit that many coils which look exactly similar exist. The correct coil for "M" valve and water valve in "Minicold 670" for operation on 220/250 v. 50 c. is Coil type MVP.18 P.

MC 43

MECHANICAL CUP STACK RELEASE

Reference to the diagram opposite will show that the reserve cup column slide is retained in its left hand position by a mechanical actuating arm formed from the two levers 'A' and 'C' pivoted at the point 'B'.

The lever assembly 'ABC' is itself pivoted at point 'D'.

In order to retain the reserve column in position it will be obvious that the assembly 'ABC' must itself be held in a pre-determined position. Similarly, of course, at that instant when the reserve column of cups is required for service, the lever assembly 'ABC' must take up a position which allows the reserve column to travel into its extreme right hand position thus replenishing the cup stock in the serving column. It is, therefore, necessary to transmit a signal to the lever assembly 'ABC' that the cup stack in the serving column is exhausted in order that the reserve column may be released.

This function is achieved by placing a cup sensing plate 'F' in a suitable position at the throat of the dispenser and mechanically linking the plate to the assembly 'ABC' by the transmitting lever 'E'.

Reference to diagram opposite will show that whilst the sensing plate 'F' is retained in position by cups in the serving column, assembly 'ABC' is so designed as to retain lever 'A' in its locked position.

At that instant when the sensing plate 'F' is allowed to travel in a left hand direction (looking into the cup turret). Lever 'C' will rotate around its pivot 'D' in such a manner that pivot 'B' travels in an upwards direction. This has the effect of increasing the distance between pivot 'B' and the top right hand side of the reverse cup column slide thus allowing lever 'A' to fall free which in turn releases the cup slide and allows it to travel and take up its full extreme right hand position thus replenishing the cup stock.

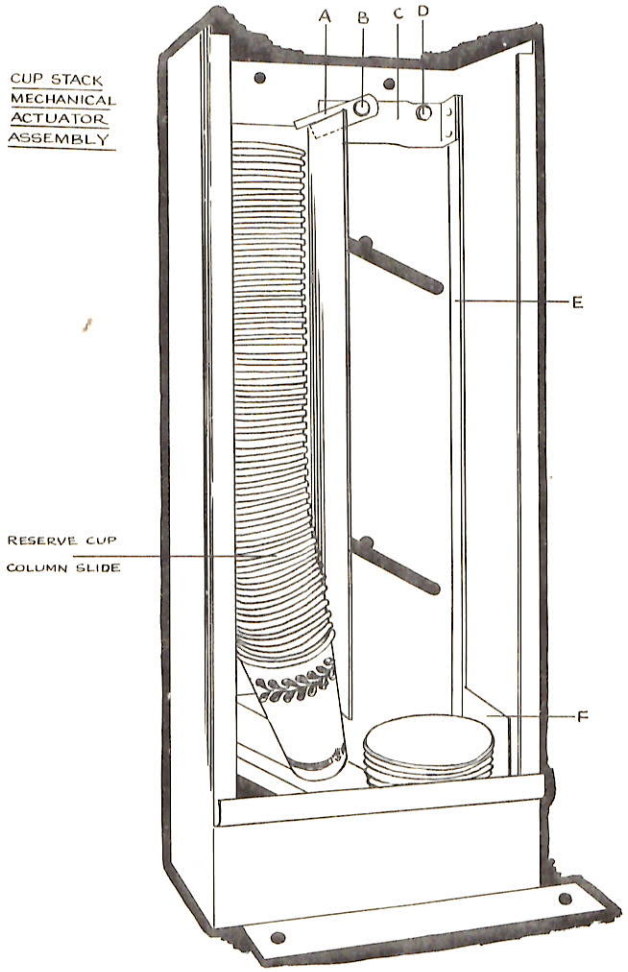
When refilling the dispenser the reserve cup slide should be moved to its extreme left hand position and a few cups placed in the throat of the dispenser, this need only be sufficient cups to retain the cup sensing plate 'F' in position.

Assembly 'ABC' will now have taken up its correct 'full' position and the cup slide will be correctly retained.

Both columns of the turret can now be fully filled with cups.

Adjustment of Release Lever

When downwards pressure is applied by the finger to pivot 'B' cups sensing plate 'F' must be so positioned by slightly 'setting' lever 'E' so that it is just touching the right hand wall of the turret.



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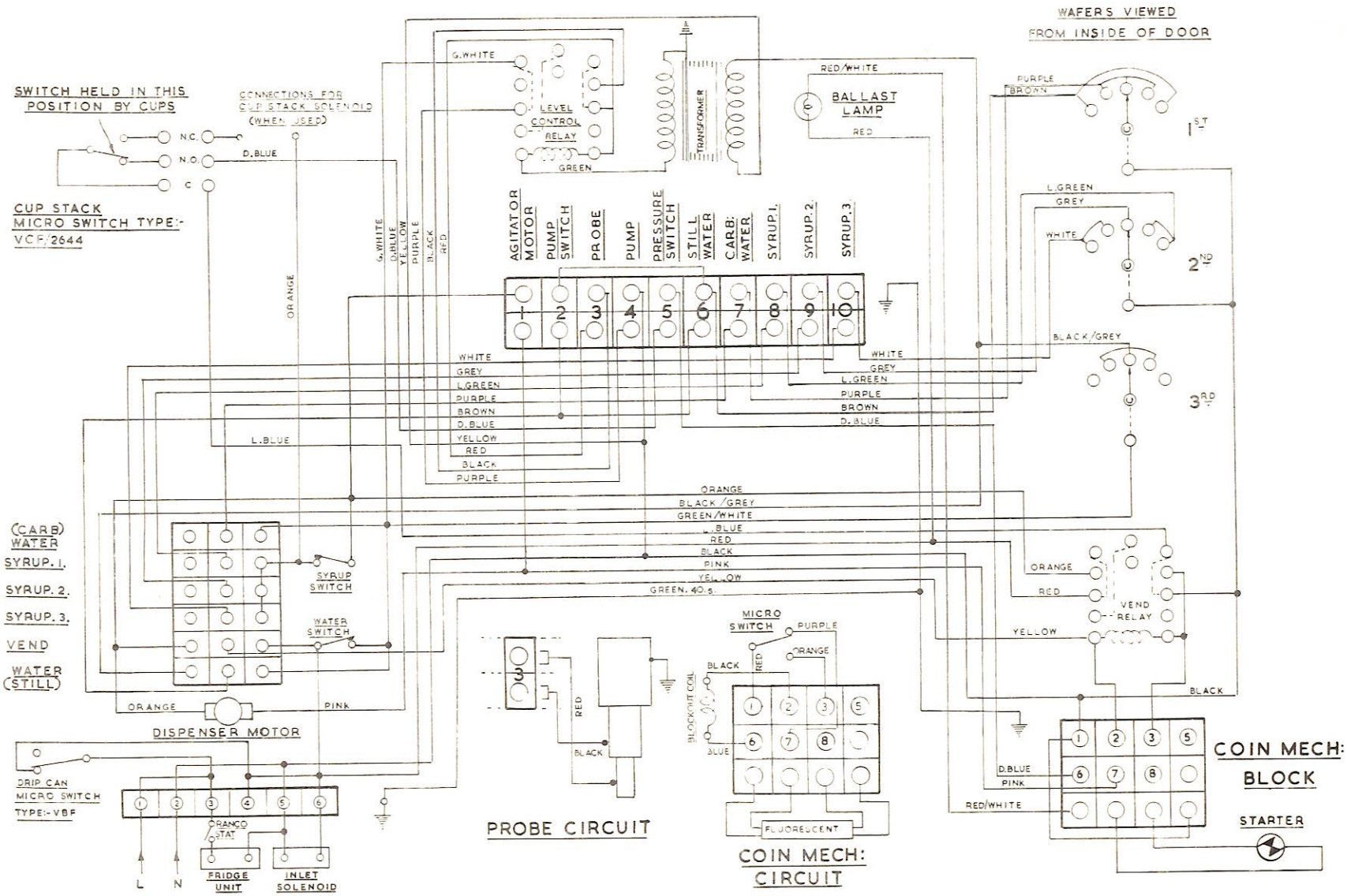
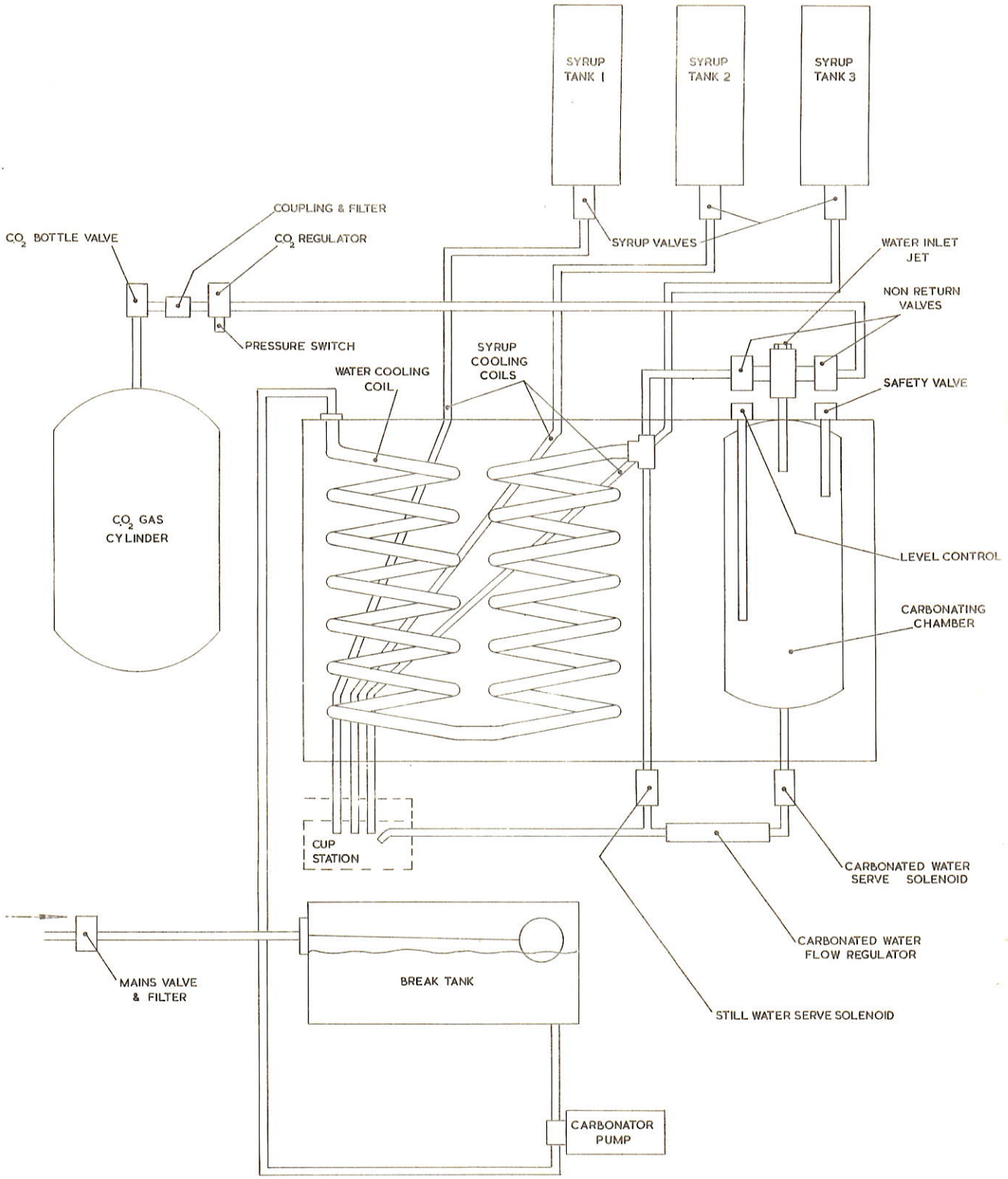
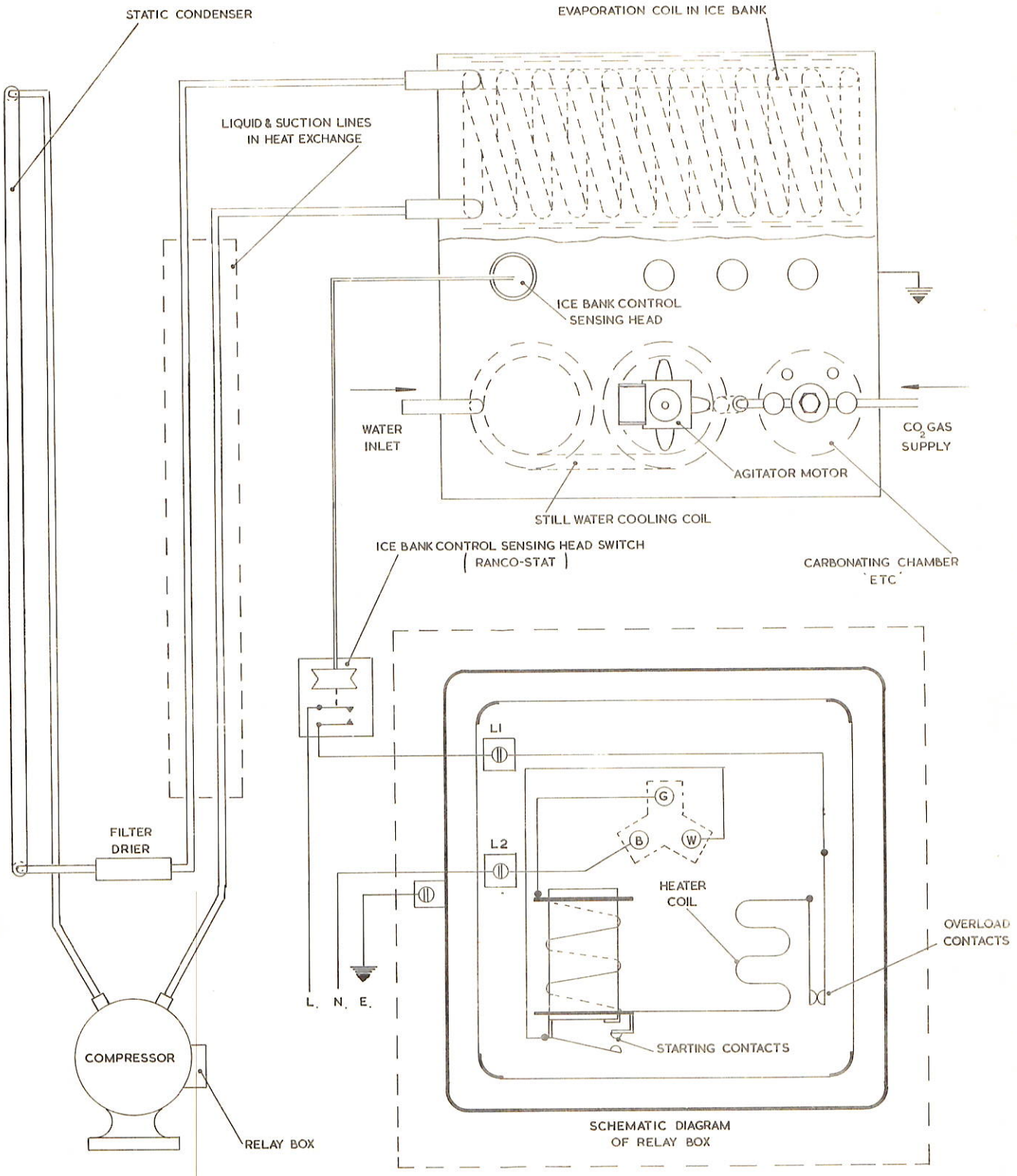


MINICOLD '670' WIRING DIAGRAM FIG. 1.



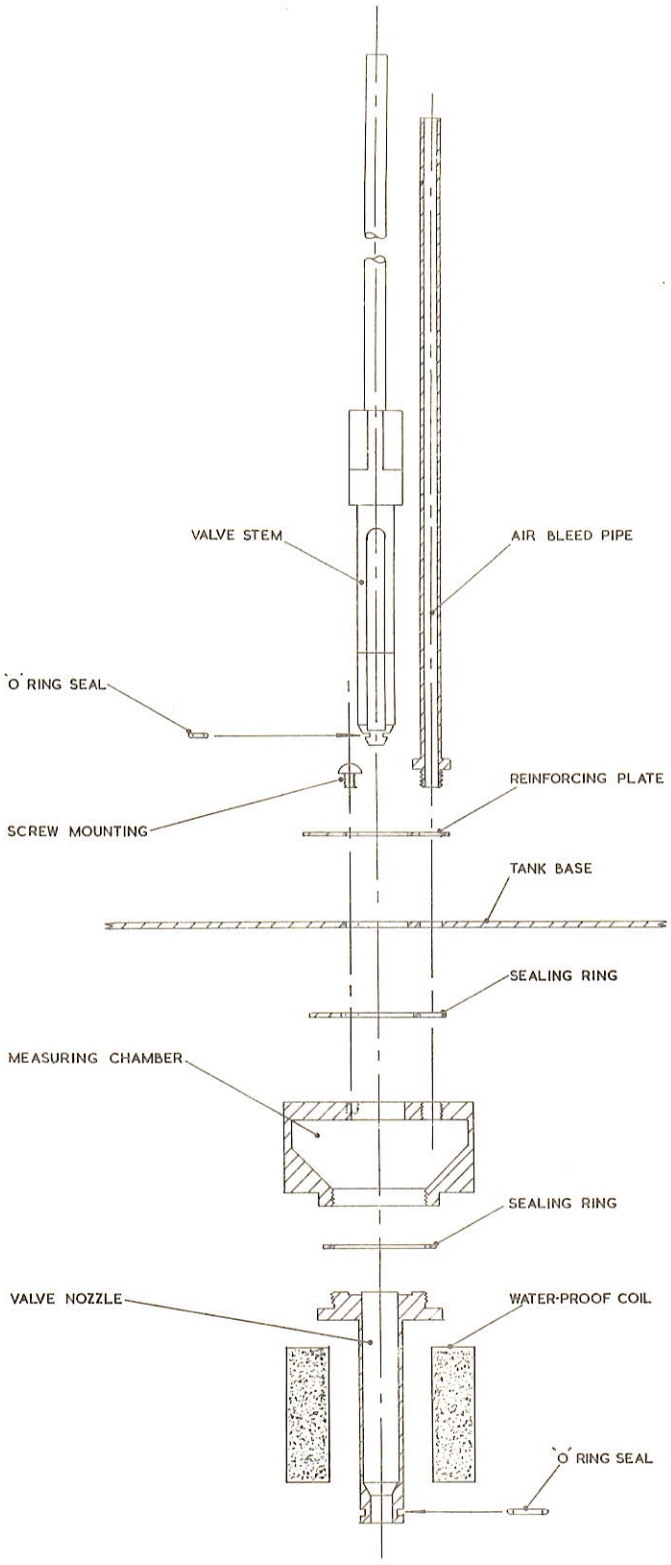
SYRUP, GAS AND WATER SYSTEM
MINI-COLD 670
FIG. 2.



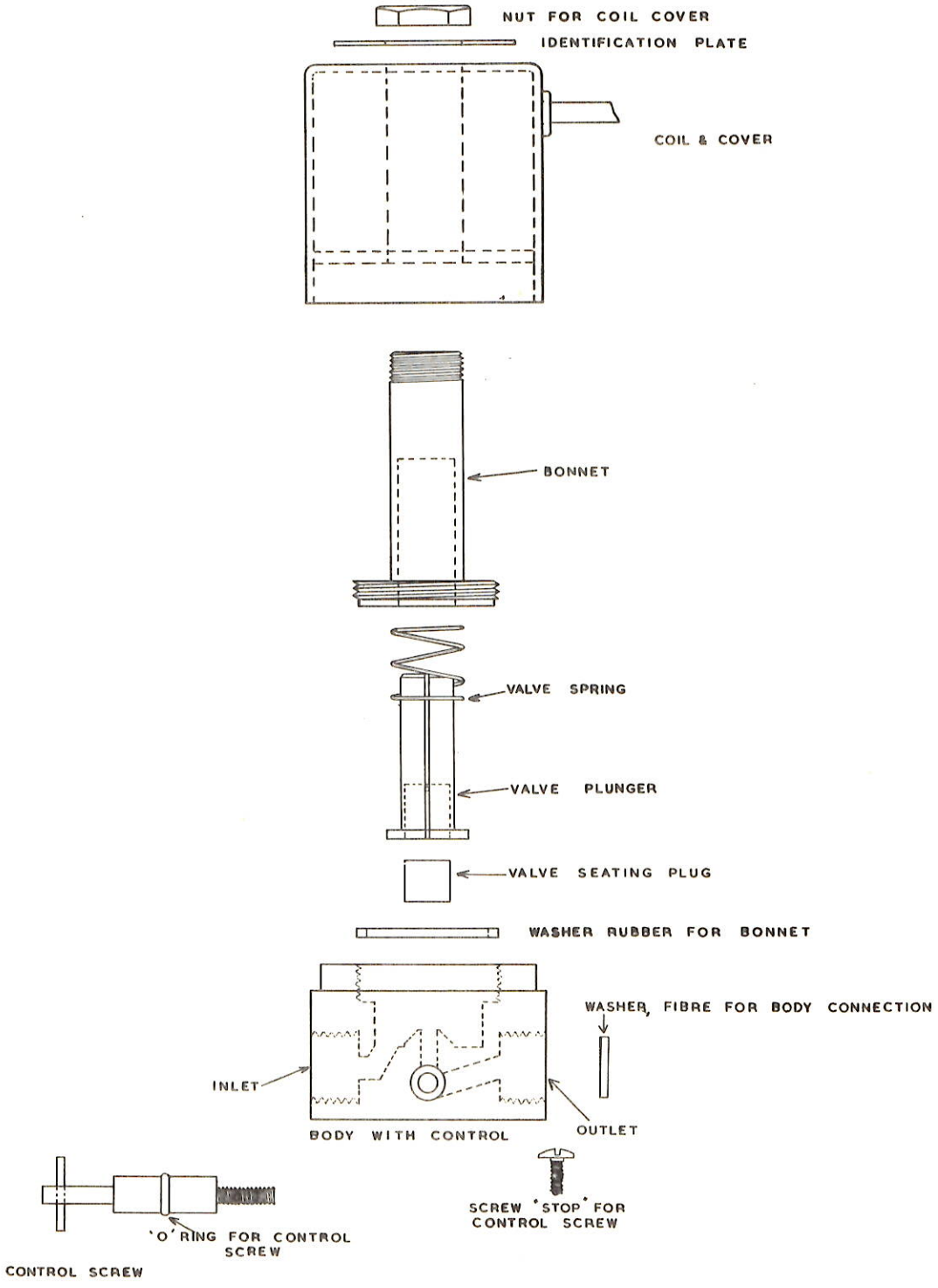
REFRIGERATION SYSTEM

MINI-COLD 670

FIG 3



MEASURING VALVE "SYRUP"
MINI-COLD 670
FIG 4



MAGNETIC VALVE

FIG. 5.

CUP DISPENSER SHELF - LOOSE LEAD CONNECTIONS

(viewed from underside)

1	2	3	4	5	6	7	8	9	10	11	12
		Red to Drip Can	Red to Drip Can		Red						
0	0	Fridge Red		Fridge Black							
Main Red	Main Black			M Valve	M Valve						

COIN MECHANISM CONNECTIONS

Red	Black	Orange	Light Green 3d/4d Vend only.
Blue	Purple	Grey for dual price vend only.	

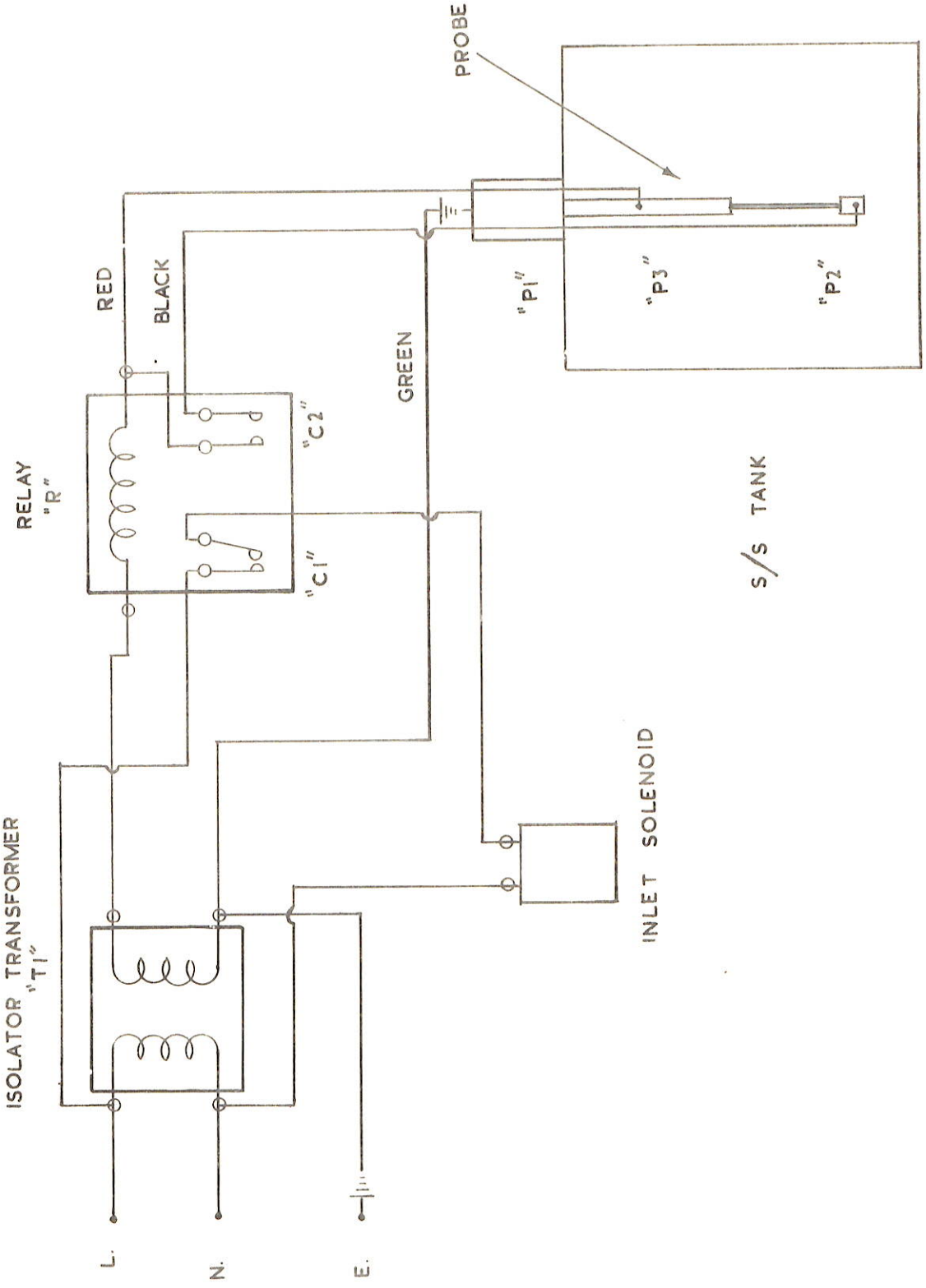
FLUORESCENT LIGHT CONNECTIONS

First white pair of leads.	Second white pair of leads.

Viewed from front.

MINICOLD '670'

FIG. 6



MINICOLD '670'
PROBE TYPE LEVEL CONTROL
FIG.7.

M I N I C O L D

SERVICE PROBLEMS AND MAINTENANCE CHART

SYMPTOM	POSSIBLE CAUSE	REMEDY: REASON	REMEDY: ACTION
1. Machine rejects all coins.	Coin blockout relay de-energised.	Electricity supply off.	Check supply points.
"		Machine fuse blown.	Locate cause and replace fuse.
"		Drip Can full.	Empty.
"		Float and ball assembly omitted.	Place in position.
"		Coin mech.plug left out of control box.	Place in position.
"		Vend relay contacts dirty.	Clean.
"		Faulty cup empty switch on dispenser.	Replace switch.
"		Blockout relay coil open circuit.	Replace.
"		Supply voltage below 220V.	Fit booster unit.
"	Reject button mal-ajusted.	Rejector bar held down.	Re-adjust pin.
"	'Anti-Jackpot' feature operating.	Damaged coin holding coin switch closed.	Remove.
"	'Sold Out'.	Cup dispenser - no cups.	Refill.
		(If foregoing does not reveal cause, check continuity of electrical harness by reference to wiring diagram.)	
2. Machine will not accept coin.	Defective coin passage.	Chute damaged or blocked with foreign matter.	Clean or replace.
3. Machine accepts coin but does not vend.	Coin not entering mechanism.	Chute mal-aligned.	Re-adjust.
Coin rejected but not returned to rejected coin cup.		Rejected coin chute mal-aligned.	Re-align.

SYMPTOM	POSSIBLE CAUSE	REMEDY: REASON	REMEDY: ACTION
4. Coin accepted, cup and water only served.	No electricity supply to syrup valves.	Syrup not switched on or switch defective.	Switch on, or replace switch.
"	"	Selector switch damaged.	Replace.
5. One particular syrup fails to deliver.	No electricity supply to syrup valve.	Faulty selector switch.	Replace switch.
"	Electricity present at valve, but valve not opening.	Faulty dispensing switch.	Replace coil.
Syrup from No.3 tank only not delivering.	Syrup "flash frozen" in collecting coil.	Refrigerator system short of gas.	Re-charge and check for leaks.
6. Ingredients but no water delivered.	No water input to machine.	Blockage in water inlet system.	Locate and rectify.
No water served.	Faulty serve valve	Faulty valve seat.	Replace seat.
		Open circuit coil.	Replace coil.
		Blockage in valve.	Clean or replace.
		Blockage in serving pipe.	Clean or replace.
7. No water served from still water solenoid.	Pump fails to start.	Faulty pump.	Repair or replace.
		No electricity supply to pump.	Locate and remedy.
"	Pump runs normally.	No water in break tank.	Check filter, inlet solenoid and ball float system.
No water served from carbonated water solenoid.	"	Excessive pressure in carbonator.	Check and reset gas regulator or replace.
		Foreign matter in water system.	Clean system.

SYMPTOM	POSSIBLE CAUSE	REMEDY: REASON	REMEDY: ACTION
8. Water served but temperature incorrect.	i) Ice bank control unit unserviceable.		Replace control unit.
"	ii) Refrigeration system not working correctly.	Short of Freon 12.	Recharge and check for leaks.
"	No electricity supply.		Check supply basis etc.
"	Container short of water.		Check for leak, refill.
"	Agitator motor not running.	Faulty motor. No electricity.	Replace, check supply.
9. Poor drink quality.	Incorrect syrup delivery.	Cams wrongly adjusted.	Re-adjust.
Syrup leaking from valve.	Air entering syrup system.	Damaged or worn 'O' rings on valve stands.	Replace.
10. Machine accepts coin but does not vend.	Cup dispenser motor does not start.	Cup dispenser motor unserviceable.	Replace motor.
All further coins rejected.		Coin switch unserviceable on motor circuit.	Replace switch.
		Vend Relay contacts dirty or out of adjustment.	Clean and re-adjust.
11. Machine accepts coin, serves drink but no cup.	Cup turret failed to change column.	Cup empty, release mechanism maladjusted or unserviceable.	Adjust or replace.
	Faulty cups.	Examine cups for defects.	Change cups and restart machine.
12. Water and ingredients 'flow on'.	Faulty cups.	Dispenser stalled by jammed cup.	Remove cups and restart machine.

	SYMPTOM	POSSIBLE CAUSE	REMEDY REASON	 ACTION
13.	Water does not enter storage tank.	Faulty inlet water solenoid.	Coil open circuit Faulty seat, etc.	Replace coil or solenoid.
		Faulty Ball Valve.	Plunger stuck - corrosion.	Clean etc.
14.	Water overflows from storage tank.	Faulty Ball Valve. Faulty seating.	Plunger stuck - corrosion.	Replace unit.

PART REQUIREMENTS

When ordering parts, please refer to the spare parts list and order by the current part number. It is essential that the serial number of the machine be quoted, together with the date of purchase, if a component is to be returned under our Warranty.

Spare parts are available on an advance replacement basis and are invoiced in full on despatch.

Consideration for credit will only be given if the suspect component is returned to our Service Department within 14 days from the date of despatch of the advance replacement. Credit will only be given if the component has failed within the terms of our Warranty and has not been the subject of misuse, accident or damage, and the acceptance of a returned component by our Service Department does not imply that credit either in full or in part will be given.

When a returned component is a bought item from an external supplier, credit can only be given if such credit is obtained by ourselves from the external supplier.

N.B. All returned components must bear a label indicating the suspected fault, the serial number of the machine from which it has been removed, and the date of purchase.

Compliance with these instructions will ensure a speedy spare part replacement.